

AMENDMENT NO. 2 JULY 2018
TO
IS 252 : 2013 CAUSTIC SODA — SPECIFICATION

(Fourth Revision)

(Page 1, clause 2) — Insert the following after IS 3025 (Part 48) : 1994:

‘IS 4016 : 2002 Density composition tables for aqueous solutions of sodium hydroxide’

(Page 1, clause 3.1) — Insert the following at the end of **3.1** and renumber the subsequent clauses:

‘**3.1.1** Lye shall be supplied in the following two grades:

- a) *Grade 1* — 47 percent NaOH by mass, *Min*, and
- b) *Grade 2* — 30 percent NaOH by mass, *Min*.’

(Page 1, clause 3.2) — Substitute the following for the existing clause:

‘**3.2 Relative Density or Concentration of Caustic Soda Lye**

For the purpose of this standard, the density composition table given in IS 4016 shall apply.’

(Page 1, clause 5.1) — Substitute the following for the existing clause:

‘**5.1 Packing**

The solid material shall be packed in laminated HDPE bags with inner polyethylene liner/ liners securely tied or sealed to avoid absorption of moisture during transport/storage, or in steel drums or as agreed to between the purchaser and the supplier. The caustic soda lye shall be supplied in tankers or tank cars, or as agreed to between the purchaser and the supplier.’

(Page 1, clause 5.2) — Substitute the following for the existing:

‘**5.2 Marking**

Each container shall be securely closed and shall bear legibly and indelibly the following information:

- a) Name and description of the material.
- b) Name of the manufacturer.
- c) Net mass of the material and
- d) Lot or batch number, in code or otherwise.

For supplies of caustic soda lye in tankers, a test report containing the following additional information shall be provided for each tanker:

- 1) Name and grade of the material.
- 2) Name of the manufacturer.
- 3) Supply date.
- 4) Tanker number.
- 5) Quantity.

The test report shall be certified by authorized person of the manufacturer’s organization.’

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(Page 2, Table 1) — Substitute the following table for the existing:

Table 1 Requirements for Caustic Soda
(Clauses 3.3 and 3.4)

Sl No.	Characteristic	Requirement			Methods of Test, Ref to
		Lye		Solid	
		Grade 1	Grade 2		
(1)	(2)	(3)	(4)	(5)	(6)
i)	Sodium carbonate (as Na ₂ CO ₃), percent by mass, <i>Max</i>	0.20	0.20	0.40	A-3
ii)	Sodium hydroxide (as NaOH), percent by mass, <i>Min</i>	47	30	97	A-4
iii)	Chlorides (as Cl ⁻), percent by mass, <i>Max</i>	0.015	0.015	0.03	A-5
iv)	Sulphates (as SO ₄ ²⁻), percent by mass, <i>Max</i>	0.015	0.015	0.03	A-6
v)	Silicates (as SiO ₂), percent by mass, <i>Max</i>	0.01	0.01	0.02	A-7
vi)	Iron (as Fe), ppm, <i>Max</i>	10	10	20	A-8 and A-15
vii)	Copper (as Cu), ppm, <i>Max</i>	1	1	2	A-9 and A-15
viii)	Manganese (as Mn), ppm, <i>Max</i>	0.5	0.5	1	A-10 and A-15
ix)	Chlorates and per-chlorates (as NaClO ₃), ppm, <i>Max</i>	40	40	10	A-11
x)	Matter insoluble water, percent by mass, <i>Max</i>	0.025	0.025	0.05	A-12
xi)	Total mercury (as Hg), ppm, <i>Max</i>	0.01	0.01	0.02	A-13
xii)	Sodium hydroxide (as NaOH), percent by mass, on drv basis. <i>Min</i>	99.50	99.20	99.50	A-14

(Page 2, clause A-3.0) — Delete.

(Page 2, clause A-3.1) — Substitute the following for the existing clause:

‘A-3.1 Double Indicator Method’

(Page 3, clause A-3.2) — Delete.

(Page 7, clause A-8.4.2) — Insert the following new clause:

‘A-8.5 Alternate Method

Iron may alternatively be estimated by the Instrumental method as prescribed at A-15.’

(Page 7, clauses A-9.3.1.1) — Insert the following new clause:

‘A-9.4 Alternate Method

Copper may alternatively be estimated by the Instrumental method as prescribed at A-15.’

(Page 8, clauses A-10.3.2) — Insert the following new clause:

‘A-10.4 Alternate Method

Manganese may alternatively be estimated by the Instrumental method as prescribed at A-15.’

(Page 11, clause A-14.1.2) — Insert the following new clause:

‘ A-15 DETERMINATION OF IRON, COPPER AND MANGANESE IN SODIUM HYDROXIDE SOLUTION BY INDUCTIVELY COUPLED PLASMA OPTICAL EMISSION SPECTROMETER (ICP-OES) METHOD

A-15.1 Reagents and Glasswares

- a) Ultra pure water : Resistivity 18.2 meg.ohm.
- b) Supra-pure Nitric acid.
- c) 50 ml Volumetric flask – Class A.
- d) Micropipette – 100 – 1 000 μ l.
- e) Micropipette — 10 – 50 μ l.
- f) Micro tips.

A-15.2 Certified Reference Material

- a) ICP multi-element standard consisting of Iron, Copper, Manganese and Nickel (100 mg/l).
- b) ICP internal standard – Yttrium (1 000 mg/l).
- c) Argon – Hi-pure : Purity : 99.999 percent.
- d) Nitrogen – Hi-pure : Purity : 99.999 percent.

A-15.3 Instrument

Inductively coupled Plasma Spectrometer - OES.

A-15.4 Sample Preparation

Take about 2.0ml of sodium hydroxide sample (in case of lye, else dissolve 0.5 g solid) into a clean 50 ml volumetric flask and diluted it to 40 ml by using Ultrapure water. Add 3.0 ml of concentrated nitric acid (Supra-pure) and 50 μ l of 1 000 mg/l Yttrium solution and dilute to the mark with ultrapure water and mix well.

A-15.4.1 Standard Solution

To each 50 ml in the volumetric flask add multi-element standards solution so as to prepare each containing 10, 25, 50, 100 and 200 μ g/l of element iron, copper, manganese and nickel. Add 1 ml of nitric acid followed by the addition of 50 μ l of Yttrium standard solution to each flask and make upto the mark with ultrapure water.

NOTE — Yttrium using as internal standard to correct the effect of viscosity and surface tension between samples and standards.

A-15.5 Instrument Conditions (Optimized Experimental Conditions)

Plasma gas flow (l/min)	:	17.0
Auxiliary gas flow (l/min):	:	0.4
Nebulizer gas flow (l/min)	:	0.6
RF power (Watts)	:	1500
Viewing height (mm)	:	15.0
Plasma view	:	Axial
Read parameters (s) Auto	:	1 to 5(Min-Max))
Peristaltic pump flow rate (ml/min)	:	1.5
Processing	:	Peak Area
Calibration	:	Linear through zero
Spray Chamber	:	Cyclonic
Nebulizer	:	Meinhard Concentric (high solid)
Injector i.d (mm)	:	2.0 (Alumina)
Quartz torch	:	1-slot

NOTE — For other instruments, follow the procedure as prescribed in respective instrument operation and instruction manual.

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A-15.6 Analysis

Perform the analysis and calculation as per the manufacturer's operation and instruction manual. Before proceeding for the analysis, construct the five point calibration curve which shall give correlation coefficient better than 0.999.

After the construction of the calibration curve, run the sample and check for the concentration by comparison with the standard curve. A spike recovery study can be carried out with the sample at 25 µg/l for all elements of interest to ensure the validity of the method. The spike recoveries obtained should be in the range of 85-110 percent for all the elements.'